

CLAIMS

- 1 1. An optical asset tracking system comprising:
 - 2 a sensor having a plurality of pixels, each pixel configured to generate an electrical signal
 - 3 in response to an optical data signal emitted by an optical tag and incident on the pixel; and
 - 4 a sensor processor in communication with the sensor, the sensor processor configured to
 - 5 generate an electrical data signal representative of the optical data signal incident on each pixel,
 - 6 the sensor processor generating asset data responsive to the electrical data signal for each pixel.
- 1 2. The optical asset tracking system of claim 1 wherein each pixel is configured to provide a
- 2 communications data signal in response to the optical data signal emitted by the optical tag and
- 3 incident on the pixel.
- 1 3. The optical asset tracking system of claim 2 wherein the sensor and the sensor processor
- 2 comprise an optical communications imager.
- 1 4. The optical asset tracking system of claim 1 wherein the sensor comprises a digital video
- 2 camera.
- 1 5. The optical asset tracking system of claim 1 wherein the sensor comprises an analog
- 2 video camera in electrical communication with a frame grabber.
- 1 6. The optical asset tracking system of claim 1 further comprising an optical tag database in
- 2 communication with the sensor processor, the optical tag database storing asset data for each of a
- 3 plurality of optical tags.
- 1 7. The optical asset tracking system of claim 1 further comprising a tracking processor in
- 2 communication with the sensor processor.
- 1 8. The optical asset tracking system of claim 7 wherein the sensor processor and the
- 2 tracking processor are integrated as a single processor.

- 1 9. The optical asset tracking system of claim 7 wherein the tracking processor comprises a
2 host computer.
- 1 10. The optical asset tracking system of claim 1 wherein asset data comprise at least one of
2 asset identification data, environmental data, medical data and status data.
- 1 11. The optical asset tracking system of claim 1 further comprising the plurality of optical
2 tags, each of the optical tags configured for attachment to an asset.
- 1 12. A method for real-time location of an asset having an optical tag, the method comprising:
2 emitting an optical data signal from the optical tag, the optical data signal including asset
3 data;
4 detecting, at a sensor comprising a plurality of pixels, the optical data signal at one or
5 more of the pixels; and
6 determining the asset data in response to the detected optical data signal.
- 1 13. The method of claim 12 further comprising determining the location of the asset in
2 response to a determination of which one or more pixels detected the optical data signal.
- 1 14. The method of claim 12 further comprising detecting an interrogation signal at the optical
2 tag and performing the step of emitting the optical data signal in response thereto.
- 1 15. The method of claim 12 further comprising:
2 determining a value of an environmental parameter;
3 comparing the value of the environmental parameter to a threshold value; and
4 performing the step of emitting the optical data signal in response to the comparison.
- 1 16. The method of claim 12 further comprising generating sensor data and wherein the asset
2 data comprises the sensor data.
- 1 17. The method of claim 12 further comprising generating processed sensor data.

- 1 18. The method of claim 12 wherein the asset data comprises at least one of asset
2 identification data, environmental data, medical data and status data.
- 1 19. An optical asset tracking system comprising:
2 a plurality of sensors each having a plurality of pixels, each pixel configured to generate
3 an electrical signal in response to an optical data signal emitted by an optical tag and incident on
4 the pixel; and
5 a plurality of sensor processors each in communication with a respective one of the
6 sensors, each sensor processor configured to provide asset data in response to the
7 communications data from the respective sensor.
- 1 20. The optical asset tracking system of claim 19 further comprising a tracking processor in
2 communication with the sensor processors through a communications network.
- 1 21. The optical asset tracking system of claim 19 further comprising a plurality of tracking
2 processors, each of the tracking processors being in communication with a respective one of the
3 sensor processors.
- 1 22. The optical asset tracking system of claim 20 further comprising an optical tag database
2 in communication with the tracking processor, the optical tag database storing asset data for each
3 of a plurality of optical tags.
- 1 23. The optical asset tracking system of claim 20 wherein the tracking processor comprises a
2 host computer.
- 1 24. The optical asset tracking system of claim 19 wherein asset data comprise at least one of
2 asset identification data, environmental data, medical data and status data.
- 1 25. The optical asset tracking system of claim 19 further comprising the plurality of optical
2 tags, each of the optical tags configured for attachment to an asset.
- 1 26. An optical tag for generating an optical data signal having asset data, comprising:

2 an optical modulator;
3 a memory module storing asset data; and
4 a tag processor in electrical communication with the optical modulator and the memory
5 module, the tag processor generating a data signal responsive to the asset data, the optical
6 modulator generating an optical data signal in response to the data signal.

1 27. The optical tag of claim 26 wherein the optical modulator comprises a light emitting
2 diode.

1 28. The optical tag of claim 26 wherein the optical modulator comprises a laser.

1 29. The optical tag of claim 26 wherein the optical modulator comprises a modulated
2 reflector.

1 30. The optical tag of claim 26 further comprising an environmental sensor in electrical
2 communication with the tag processor.

1 31. The optical tag of claim 26 further comprising a control circuit in electrical
2 communication with the tag processor and the optical modulator, the control circuit providing a
3 control signal responsive to the data signal.

1 32. The optical tag of claim 26 wherein the asset data comprise at least one of asset
2 identification data, environmental data, medical data and status data.

1 33. The optical tag of claim 26 wherein the tag processor generates a clock signal to trigger
2 broadcasts of asset data.

1 34. The optical tag of claim 33 wherein the control signal generated by the tag processor is
2 periodic.

1 35. The optical tag of claim 34 wherein the control signal generated by the tag processor is
2 continuous.

1 36. The optical tag of claim 31 further comprising a trigger sensor to detect an interrogation
2 signal in communication with the tag processor, the control signal being responsive to the
3 detection of the interrogation signal at the trigger sensor.

1 37. The optical tag of claim 36 wherein the trigger sensor is one of an optical sensor, an RF
2 sensor, an acoustic sensor and an environmental sensor.

1 38. The optical tag of claim 26 further comprising a switch in electrical communication with
2 the processor, the control signal generated by the tag processor causing the optical modulator to
3 initiate an on-demand broadcast of optical data in response to an activation of the switch.

1 39. The optical tag of claim 26 wherein the memory module is provided by an asset.

1 40. The optical tag of claim 26 further comprising an interface module in communication
2 with the tag processor.